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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/538,118	06/07/2005	Yoshito Hashimoto	70404.62/ok	8790

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EXAMINER	
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ART UNIT	PAPER NUMBER
1794	

NOTIFICATION DATE	DELIVERY MODE
06/27/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/538,118	HASHIMOTO ET AL.	
	Examiner	Art Unit	
	SOPHIE HON	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1, 5-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,5-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment and Arguments

Withdrawn Rejections

1. The objections to claims 7-10 are withdrawn due to Applicant's amendment dated 3/20/08.

2. The 35 U.S.C. 102(b) rejection of claims 1-3, 6, 8 over Emerson is withdrawn due to Applicant's amendment dated 3/20/08.

3. The 35 U.S.C. 103(a) rejections of the remaining claims over Emerson as the primary reference are withdrawn due to Applicant's arguments.

New Rejections

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1, 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Menzer (US 3,137,601).

Regarding claim 1, Menzer teaches a plastic substrate comprising: a composite substrate in which fibers are embedded in a resin matrix (resin impregnated fiber sheet, column 1, lines 29-31), the fibers being arranged to extend in two nearly orthogonal directions within the plane of the composite substrate (fibers arranged in crossed relation so as to form a matted structure, column 1, lines 70-72), wherein the composite substrate substantially transmits visible radiation (light transmission, column 21, lines

45-55). Menzer teaches that the refractive index of the fibers match the refractive index of the resin (column 2, lines 40-43, 54-58) to avoid interference of visible fibers to provide undistorted light transmission through the resin sheet (column 2, lines 40-50). Optical in-plane retardation occurs when there are refractive index differences within the plane of the substrate. Thus, the composite substrate of Menzer has an in-plane retardation of substantially zero in the absence of a refractive index difference in the plane of the substrate due to the matching of the refractive indices of the fibers and the resin.

Although Menzer fails to teach that the composite substrate is for use in optical instruments, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In the instant case, the composite substrate of Menzer is the same as the one that is presently claimed and is taught as suited for optical use (undistorted light transmission, column 2, lines 45-50), and thus is capable of performing the intended use.

Regarding claim 7, Menzer teaches that the fibers are embedded in the resin matrix as a bundle of fibers, a woven fabric or a nonwoven fabric (column 2, lines 5-10).

Claim Rejections - 35 USC § 103

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Menzer as applied to claims 1, 7 above, and further in view of Speakman (US 6,503,831) and Aizawa (US 5,179,456).

Menzer teaches the composite substrate which substantially transmits visible radiation and has an in-plane retardation of substantially zero, i.e. nx=ny, as described above. Menzer fails to disclose that the composite substrate has negative uniaxial anisotropy.

However, Menzer teaches that the composite substrate is suitably arranged about a light source to provide a display (column 1, lines 45-52), where the ultimate objective is to provide an undistorted image display (avoid interference with clear perception of the design, column 2, lines 40-46).

Speakman teaches a liquid crystal display device (column 25, line 10) which display medium is a liquid crystal layer by definition. Speakman teaches that a typical substrate for the device comprises a composite substrate in which fibers are embedded in a resin matrix (fiber-reinforced epoxy resin sheet, column 45, lines 37-40), for the purpose of utilizing its physical properties.

Aizawa teaches that when the liquid crystal layer of a liquid crystal display device is homeotropically aligned (column 2, lines 13-20), an optical compensator having a negative uniaxial anisotropy (nx=ny>nz, column 5, lines 45-48) is used in the display device, for the purpose of providing the desired optical compensation for the positive

optical anisotropy of the homeotropically aligned liquid crystal (column 2, lines 13-20), so as to widen the viewing angle of the display where an undistorted image is displayed (column 3, lines 10-15). Aizawa teaches that the refractive indices in the orthogonal major axes of the optical plane are equal (nx=ny, column 5, lines 45-48), which means that the in-plane retardation is substantially zero (reduces the in-plane optical anisotropy to not higher than 1%, column 6, lines 55-60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the composite substrate of Menzer as a substrate in a liquid crystal display, as taught by Speakman, and to have provided the composite substrate with a negative uniaxial anisotropy, in order to provide a liquid crystal display where the liquid crystal layer has positive optical anisotropy, with the desired undistorted image display, as taught by Aizawa.

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Menzer as applied to claims 1, 7 above, and further in view of Speakman (US 6,503,831) and Emerson (US 3,353,895).

Menzer teaches the composite substrate which is suitable for use in optical instruments, as described above. Menzer fails to teach that the composite substrate functions as a quarter-wave plate.

However, Menzer teaches that the composite substrate is suitably arranged about a light source to provide a display (column 1, lines 45-52) where the ultimate objective is to provide an undistorted image display (avoid interference with clear perception of the design, column 2, lines 40-46).

Speakman teaches a liquid crystal display device (column 25, line 10) which display medium is a liquid crystal layer by definition. Speakman teaches that a typical substrate for the device comprises a composite substrate in which fibers are embedded in a resin matrix (fiber-reinforced epoxy resin sheet, column 45, lines 37-40), for the purpose of utilizing its physical properties. A liquid crystal layer has optical anisotropy which requires optical retardation compensation to provide an undistorted image display, as is well known in the art.

Emerson teaches a composite substrate in which fibers are embedded in a resin matrix (a layer of plastic cast on or applied to a surface carrying the filaments, column 2, lines 8-10), where, when the fibers of the composite substrate are arranged at 45° to the long direction of filaments 32 in another layer, a quarter-wave retardation layer is formed (column 6, lines 30-40), which means that the composite substrate functions as a quarter-wave plate with the desired optical retardation in the thickness direction when suitably arranged.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the composite substrate of Menzer as a substrate in a liquid crystal display, as taught by Speakman, and to have arranged it so that it functions as a quarter-wave plate, as taught by Emerson, in order to provide the desired optical retardation function to obtain the final undistorted image display, as is well known in the art.

7. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Menzer as applied to claims 1, 7 above, and further in view of Babb (US 5,730,922).

Menzer teaches the composite substrate described above. Menzer fails to teach a protective coating on at least one principal surface of the composite substrate.

However, Babbs teaches a composite layer in which fibers (woven glass fiber, column 2, lines 39-40) are embedded in a resin matrix (column 2, lines 44-45). Babbs teaches that the composite laminate further comprises a coating on at least one principal surface of the composite layer (layer of polymer added to improve at least one property, column 2, lines 23-29) for the purpose of providing protection from moisture and scratching (resistance, column 2, lines 25-32).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided a protective coating on at least one principal surface of the composite substrate of Menzer, in order to provide scratch resistance and moisture resistance, as taught by Babbs.

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Menzer as applied to claims 1, 7 above, and further in view of Speakman (US 6,503,831).

Menzer teaches the composite substrate which substantially transmits visible radiation and has an in-plane retardation of substantially zero, as described above. Menzer fails to teach that the composite substrate is used as a substrate in a liquid crystal display device comprising a liquid crystal layer.

However, Menzer teaches that the composite substrate is suitably arranged about a light source to provide a display (column 1, lines 45-52), wherein the composite substrate is suitable for use in optical instruments as described above.

Speakman teaches a liquid crystal display device (column 25, line 10) which display medium is a liquid crystal layer by definition. Speakman teaches that a typical substrate for the device comprises a composite substrate in which fibers are embedded in a resin matrix (fiber-reinforced epoxy resin sheet, column 45, lines 37-40), for the purpose of utilizing its physical properties.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the composite substrate of Menzer as a substrate of a liquid crystal display device, as taught by Speakman, in order to provide a suitable substrate with the desired physical properties.

9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Menzer in view of Speakman as applied to claim 9 above, and further in view of Emerson (US 3,353,895) and Arakawa (US 2002/0060762 A2).

Menzer, as modified by Speakman, teaches a liquid crystal display device comprising the composite substrate, as discussed above. Menzer, as modified by Speakman, fails to teach that the liquid crystal display device further comprises a polarizer arranged such that the absorption axis of the polarizer is either substantially parallel or substantially perpendicular to the at least one predetermined direction in which the fibers are arranged.

However, Emerson teaches a composite substrate in which fibers are embedded in a resin matrix (a layer of plastic cast on or applied to a surface carrying the filaments, column 2, lines 8-10), where, when the fibers of the composite substrate are arranged at 45° to the long direction of filaments 32 in another layer, a quarter-wave retardation layer is formed (column 6, lines 30-40), which means that the composite substrate functions as a quarter-wave plate with the desired optical retardation in the thickness direction when suitably arranged.

Arakawa teaches that a plastic substrate that functions as a quarter-wave plate, can be used as one of the substrates used to sandwich the liquid crystal layer in a liquid crystal display device, for the purpose of reducing the weight and the thickness of the display device (page 1, [0014]) as well as providing the desired optical retardation compensation. A liquid crystal layer has optical anisotropy which requires optical retardation compensation to provide an undistorted image display, as is well known in the art. Arakawa teaches that the liquid crystal display device further comprises a polarizer 32 disposed on one side of the liquid crystal layer 28, for the purpose of providing the desired linearly polarized light (page 8, [0084]). When the transmission axis of the polarizer is substantially parallel to the anisotropic and hence transmitting axis of the composite substrate that functions as a quarter-wave plate, the linearly polarized light transmitted by the polarizer is transmitted by the quarter-wave plate. The absorption axis of the polarizer is perpendicular to the transmission axis of the polarizer, and is thus substantially perpendicular to the anisotropic axis of the composite substrate.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have arranged the composite substrate in the liquid display device of Menzer , as modified by Speakman, to function as a retardation plate, as taught by Menzer, and to have further arranged a polarizer such that the absorption axis of the polarizer is substantially perpendicular to the anisotropic axis of the composite substrate, and hence the at least one predetermined direction in which the fibers are arranged in the composite substrate, disposed on one side of the liquid crystal layer of the liquid crystal display device, in order to provide the desired transmission of linearly polarized light, as taught by Arakawa.

Response to Arguments

10. Applicant's arguments with respect to Emerson as a primary reference have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Keith Hendricks, can be reached on (571)272-1401. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Sophie Hon/

Sow-Fun Hon

/KEITH D. HENDRICKS/
Supervisory Patent Examiner, Art Unit 1794